

Remarks

This is a response to the Office Action mailed on August 27, 2003.

The specification is amended to refer to further details of the cited co-pending applications.

Claims 3, 5, 7, 10, 15, 24 and 25 are original.

Claims 5, 8, 9 and 20 are cancelled.

Claims 1, 2, 4, 6, 11-14, 16-19 and 21-23 are amended to improve clarity.

Claims 1 and 22 are amended based on, e.g., page 16, lines 17-19, and page 18, lines 6-21 of the specification, and Figure 1.

Claim 6 is amended to incorporate the subject matter of former claim 5, and the term "image" in former claim 5 is replaced by "map" for consistency with claim 1.

Claims 26-28 are new.

Claim 26 combines former claims 1, 5 and 8 but refers to measuring an "energy" rather than a "density" of energy for simplification, and the term "image" in former claim 5 is replaced by "map" for consistency with claim 1.

Claim 27 combines former claims 1 and 9 but refers to measuring an "energy" rather than a "density" of energy for simplification.

Claim 28 combines former claims 1 and 20 but refers to measuring an "energy" rather than a "density" of energy for simplification.

The Examiner has indicated that claims 8, 9, 20 and 21 include allowable subject matter. Accordingly, claims 26-28, which incorporate the allowed subject matter, are believed to be in condition for immediate allowance.

Claims 1-7, 10, 19 and 22-25 have been rejected under 35 USC 102(e) as being anticipated by U.S. patent 6,006,128 to Izatt et al. Claims 1 and 2 are believed to clearly distinguish over Izatt et al. Izatt et al. are concerned with Doppler flow imaging using optical coherence tomography. Thus, this approach relies on the detection of coherent light signals.

In contrast, Applicant's invention is concerned with measuring energy that has been highly scattered by a target medium. The Doppler approach of Izatt et al. is not suited to this

situation since, once the injected light energy is highly scattered, the light takes on particle properties. Properties of the light wave front cannot be detected and the Doppler shift is zero.

Moreover, Applicant's invention uses a plurality of detectors that are positioned at different locations around the target medium to detect the emerging energy. This approach is advantageous for a variety of reasons. For example, the approach of the present invention allows imaging of vascular states in large tissue structures. In contrast, the Doppler methods used by Izatt et al. and others are limited principally to near-surface measures (see Applicant's specification, page 8, line 20 to page 9, line 2).

Moreover, the present invention recognizes the value of measuring dynamic properties in highly scattering media in the time domain rather than minimizing the effect of dynamic behavior, e.g., by collecting only a snapshot of the target medium (specification, page 19, line 18 to page 20, line 3). For example, as set forth in claims 2 and 23, the invention also allows a time series of images of the properties of the target medium to be generated, where each image represents the cross-sectional properties of the target medium at a time interval during a period of time.

Withdrawal of the rejection under Izatt et al. is therefore respectfully requested.

Claims 14-18 have been rejected under 35 USC 102(e) as being anticipated by U.S. patent 6,263,227 to Boggett et al. Boggett et al. is concerned with using Doppler imaging to measure blood flow at the tissue surface, typically the skin surface (see, e.g., column 1, lines 26-29, and column 2, lines 25-39). Thus, a significant difference from the present invention as set forth in claims 1 and 22 is that the present invention is concerned with measuring energy that has been highly scattered by a target medium, where a plurality of detectors are positioned at different locations around the target medium to detect the emerging energy. Moreover, regarding claim 18, the Examiner fails to cite where Boggett et al. teaches generating an image of the dynamic properties of a target medium by using time series analysis to enhance the contrast of at least one of veins, arteries and micro vessels.

Accordingly, withdrawal of the rejection under Boggett et al. is respectfully requested.

Claims 11-13 have been rejected under 35 USC 103(a) as being unpatentable over Izatt et al. Regarding the use of a provocation, the Examiner asserts that it would have been an obvious matter of design choice to adapt the Izatt et al. device for use in studies which

induce exercise of the test subject. The Examiner is respectfully requested to cite the basis for this assertion in the context of Applicant's invention.

In view of the above, each of the claims is believed to be in condition for immediate allowance, and the Examiner is requested to pass this application on to an early issue. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,



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